

WE CLAIM:

1. A friction material comprising a fibrous base material impregnated with at least one curable resin, the fibrous base material comprising a high fiber content porous primary layer and a secondary layer comprising friction modifying particles on at least one surface of the primary layer.

2. The friction material of claim 1, wherein the secondary layer comprises about 5% to about 15%, by weight, of friction modifying particles, based on the weight of the fibrous base material.

3. The friction material of claim 1 wherein the secondary layer comprises a mixture of carbon particles and silica particles.

4. The friction material of claim 3 wherein the friction modifying particles are present at about 0.2 to about 20%, by weight, based on the weight of the fibrous base material, the friction modifying particles covering about 3% to about 30% of the surface area of the primary layer.

5. The friction material of claim 3, wherein the secondary layer comprises about 20% to about 35%, by weight, of silica particles, and about 65% to about 80% carbon particles, based on the total weight of the friction modifying particles..

6. The friction material of claim 1, wherein the friction modifying particles have an average size ranging from about 0.5 to about 20 microns.

7. The friction material of claim 3, wherein the friction modifying particles comprise a mixture of i) diatomaceous earth particles and ii) fully carbonized carbon particles or partially carbonized particles, and mixtures thereof.

8. The friction material of claim 1, wherein the fibrous base material defines pore diameters ranging in mean average size from about 2.0 to about 25 microns.

5 9. The friction material of claim 1, wherein the primary layer has readily available air voids of at least about 50%.

10 10. The friction material of claim 1, wherein the fibrous base material comprises at least one type of aramid fibers, cotton fibers, graphite particles, and, at least one type of filler material.

11. The friction material of claim 10, wherein the aramid fibers have a freeness of about 350 to about 650 on the Canadian Standard Freeness index.

15 12. The friction material of claim 10, wherein the aramid fibers have average fiber lengths in the range of about 0.5 to about 10 mm.

20 13. The friction material of claim 10, wherein the filler comprises diatomaceous earth.

25 14. The friction material of claim 10, wherein the fibrous base layer comprises about 50 to about 6%, by weight, aramid fibers; about 40 to about 10%, by weight, cotton fibers; about 5-15%, by weight, carbon fibers; about 20 to about 30%, by weight, graphite particles; and, about 5 to about 15%, by weight, filler material.

30 15. The friction material of claim 1, impregnated at about 35 to about 40% resin, by weight, with at least one of: a phenolic resin, a modified phenolic resin, or a mixture of a phenolic resin and a silicone resin wherein the amount of silicone resin in the mixture ranges from approximately 5 to approximately 80%, by weight, based on the weight of the mixture wherein the phenolic resin

is present in a solvent material and the silicone resin is present in a solvent material which is compatible with the solvent material of the phenolic resin.

5           16.     The friction material of claim 1, wherein the fibrous base material comprises a plurality of less fibrillated aramid fibers having a freeness of at least about 300 on the Canadian Standard Freeness (CSF) index, carbon fibers, graphite particles, and, at least one filler material.

10           17.     The friction material of claim 16, wherein the less fibrillated aramid fibers have a freeness of about 430 to about 650 on the Canadian Standard Freeness index.

15           18.     The friction material of claim 17, wherein the aramid fibers have average fiber lengths in the range of about 0.5 to about 10 mm.

20           19.     The friction material of claim 16, wherein the fibrous base layer comprises about 50 to about 60%, by weight, less fibrillated aramid fibers; about 5 to about 20%, by weight, carbon fibers; about 20 to about 30%, by weight, graphite particles; and, about 3 to about 15%, by weight, filler material.

25           20.     A process for producing a friction material comprising:  
              forming a high fiber content fibrous base material,  
              coating about 3% to about 30% of at least one surface of the fibrous base material with friction modifying particles comprising a mixture of carbon particles and silica particles, the friction modifying particles being present at about 0.2 to about 20%, by weight, based on the weight of the fibrous base material, and

30                 impregnating the coated fibrous base material with a phenolic resin, phenolic-based or a phenolic-silicone resin mixture, and thereafter curing the impregnated fibrous base material at a predetermined temperature for a predetermined period of time.